

AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. Appln. No. 10/647,669

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (original): A liquid ejection head, comprising:
 - a chamber formation plate, having a first face formed with a plurality of recesses arranged in a first direction at a fixed pitch, such that each of the recesses is communicated with, via a through hole, a second face which is an opposite face of the first face, the chamber formation plate comprised of nickel;
 - a sealing plate, joined to the first face of the chamber formation plate so as to seal the recesses to form a plurality of pressure generating chambers; and
 - a metallic nozzle plate, formed with a plurality of nozzles, and joined to the second face of the chamber formation plate such that each of the nozzles is communicated with associated one of the pressure generating chamber via the through hole,
 - wherein a ratio of a grain size of a crystal of the nickel with respect to a thickness of a partition wall defined between each adjacent ones of the recesses is 60% or less.
2. (original): The liquid ejection head as set forth in claim 1, wherein the thickness of the partition wall falls within a range of 20 μ m to 50 μ m.

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3. (original): The liquid ejection head as set forth in claim 2, wherein the grain size is no less than 5 μ m and less than 25 μ m.
4. (original): The liquid ejection head as set forth in claim 1, wherein a Vickers hardness of the nickel is no less than 150Hv and less than 190Hv.
5. (original): The liquid ejection head as set forth in claim 1, wherein a ductility of the nickel is greater than 5% and less than 20%.
6. (original): The liquid ejection head as set forth in claim 1, wherein a ratio of a height of the partition wall with respect to the thickness of the partition wall falls within a range of 1.0 to 2.1.
7. (original): The liquid ejection head as set forth in claim 1, wherein a ratio of a width of each of the recesses with respect to the thickness of the partition wall falls within a range of 2.0 to 5.0.
8. (original): The liquid ejection head as set forth in claim 1, wherein a ratio of a depth of each of the recesses with respect to the thickness of the partition wall falls within a range of 2.0 to 4.5.

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9. (original): The liquid ejection head as set forth in claim 1, wherein:

a bottom of each of the recesses has a V-shaped cross section when viewed from a second direction perpendicular to the first direction; and

an angle between faces forming the V-shaped cross section falls within a range of 45 degrees to 110 degrees.

10. (original): The liquid ejection head as set forth in claim 1, wherein the fixed pitch is 0.3mm or less.

11. (canceled).

12. (canceled).

13. (new): A liquid ejection head, comprising:

a first pressure generating chamber;

a second pressure generating chamber disposed adjacent to the first pressure generating chamber;

a partition wall formed between the first pressure generating chamber and the second pressure generating chamber;

a first nozzle that communicates with the first pressure generating chamber via a first through hole; and

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a second nozzle that communicates with the second pressure generating chamber via a second through hole,

wherein the partition wall comprises nickel having a particle size, and

wherein the partition wall has a thickness defined in a direction from the first pressure generating chamber to the second pressure generating chamber, and

wherein a ratio of the particle size to the thickness is 60% or less.

14. (new): The liquid ejection head as claimed in claim 13, comprising:

a chamber formation plate having a first face and a second face that is opposite to the first face,

wherein a first recess and a second recess are formed in the first face and form part of the first pressure generating chamber and the second pressure generating chamber, respectively,

wherein the partition wall is part of the chamber formation plate between the first recess and the second recess, and

wherein the chamber formation plate comprises the nickel having the particle size; and

a metallic nozzle plate in which the first nozzle and the second nozzle are formed,

wherein the first through hole and the second through hole create openings in the second face to enable the first nozzle and the second nozzle to respectively communicate with the first recess and the second recess.

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15. (new): The liquid ejection head as claimed in claim 13, wherein the thickness of the partition wall is between 20 microns and 50 microns.

16. (new): The liquid ejection head as claimed in claim 15, wherein the particle size is between 5 microns and 25 microns.

17. (new): The liquid ejection head as claimed in claim 13, wherein a Vickers hardness of the nickel is between 150 Hv and 190Hv.

18. (new): The liquid ejection head as claimed in claim 13, wherein a ductility of the nickel is between 5% and 20%.

19. (new): The liquid ejection head as claimed in claim 13, wherein a ratio of a height of the partition wall to the thickness of the partition wall is between 1.0 and 2.1.

20. (new): The liquid ejection head as claimed in claim 14, wherein a width of the first recess to the thickness of the partition wall is between 2.0 and 5.0.

21. (new): The liquid ejection head as claimed in claim 14, wherein a depth of the first recess to the thickness of the partition wall is between 2.0 and 4.5.

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22. (new): The liquid ejection head as claimed in claim 14, wherein a bottom of the first recess and the second recess has a V-shaped cross section when viewed along a length of the first recess and the second recess.

23. (new): The liquid ejection head as claimed in claim 22, wherein an angle between faces forming the V-shaped cross section is between 45 degrees and 110 degrees.

24. (new): The liquid ejection head as claimed in claim 1, wherein the chamber formation plate has a single layer structure.